

tissues and the skeleton, and in the fact that the mineral constituent of the latter is not in the form of calcite.

Mr. E. T. Newton, F.R.S., showed a series of otoliths, chiefly of living British fishes, both marine and freshwater, showing the various forms assumed in the different genera.

Prof. W. K. Huntington exhibited (1) a tilting stage for the microscope; (2) optical bench for metallurgical work.

Dr. A. Muirhead gave a demonstration of retransmission on submarine telegraph cables (cable relaying).

Kite and winding-in apparatus for raising meteorological instruments was shown by Mr. W. H. Dines.

The distribution of electric currents induced in a solid iron cylinder when rotated in a magnetic field was shown by Prof. E. Wilson.

During the evening, demonstrations, by means of the electric lantern, were given in the meeting room by Sir Henry Trueman Wood, on the application of photography to the production of pictures in colour, and Dr. R. D. Roberts, on lantern slides in natural colours of the Grand Cañon of the Colorado, the Sierra Nevada, California and the Yellowstone Park.

### NOTES.

THE *London Gazette* announces that Sir William Turner Thiselton-Dyer, K.C.M.G., C.I.E., F.R.S., Director of the Royal Botanic Gardens, Kew, has been appointed Botanical Adviser to the Secretary of State for the Colonies.

DURING the first half of this month the weather over this country was very abnormal for the season. The reports issued by the Meteorological Office show that in the early part of the month a decided depression approached from the north-west, the centre advancing over Scotland, travelling to the south-east, and causing thunderstorms and hail in many places. The subsequent distribution of pressure, which was relatively high off our south-west coasts and over north and south-west Europe, while depressions lay in various parts of the intervening regions, occasioned persistent inclement northerly and north-easterly winds. These continued with little variation until May 14, by which time a great change occurred in the type of pressure, under the influence of which westerly winds and some rise of temperature subsequently occurred, but heavy and sudden downpours of rain continued between the bright intervals. For any comparison of the persistent cold spell it is necessary to go back to the year 1879, when, during the first half of May, the mean of the daily shade maxima at Greenwich was approximately  $54^{\circ}$  and the minima  $36^{\circ}$ , against  $53^{\circ}$  and  $37^{\circ}$  in the corresponding period of this year. The maximum shade temperature on any day has not exceeded  $57^{\circ}3$ , but in 1879 the maximum temperature exceeded  $60^{\circ}$  on three occasions and reached  $66^{\circ}2$  on May 5. On the night of the 13-14th, the exposed thermometer on the grass registered  $22^{\circ}6$  in the neighbourhood of London, and the maximum of the previous day was about  $14^{\circ}$  below the normal, while in May 1879 the lowest grass temperature was  $24^{\circ}6$ . An examination of the Greenwich records since 1840 shows that there has been no year, except the present, in which the shade temperature has not reached  $60^{\circ}$  during the first half of May.

IN NATURE of February 20 (vol. lxxv. p. 367), Mr. A. B. MacDowall pointed out that the Greenwich observations of the last thirteen years favour a connection between thunderstorms and the lunar phases, as has been found for other places. Investigation of the meteorological records of several observatories show that a larger percentage of thunderstorms occur about the time of new moon than about full moon, and in the two earlier phases than in the two later. M. V. Ventosa writes from the Madrid Observatory to say that he has obtained similar evidence of this relationship from an examination of observations made at that Observatory in the twenty years 1882-1901. Classified in

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four groups about four lunar phases, the results are as follows:—

	New Moon.	First Quarter.	Full Moon.	Last Quarter.
Thunderstorms ...	132 ...	104 ...	99 ...	120
Percentage ...	29.0 ...	22.8 ...	21.8 ...	26.4

Mr. MacDowall, to whom we have shown M. Ventosa's letter, remarks:—"The results are an interesting extension of the subject. While at none of the stations which have thus been compared are the differences between those weekly percentage numbers large, the general agreement, in showing, especially, more thunderstorms about new moon than about full moon seems remarkable, and may (I also hope) incite to further inquiries in the same direction, where the requisite data are available."

SEVERAL correspondents have sent us references to observations of peculiar lunar halos such as that described by Prof. Barnard in our issue of May 1 (p. 5). The singularity consisted in the moon being in the centre of one halo and on the circumference of another at the same time. Mr. H. W. Croome Smith directs our attention to a similar appearance observed on February 28, 1890, and described in the *Bristol Times and Mirror* of the following day. The moon was then nine days old, so that the conditions were very similar to those existing at the time of Prof. Barnard's observation.

THE last Report of Mr. W. Bell Dawson, C.E., on the survey of the tides and currents in Canadian waters contains an interesting account of the work that is being carried on in obtaining data as to the tides in the St. Lawrence and in the Bay of Fundy, and in the preparation of trustworthy tide-tables for Halifax, Quebec, St. John's and British Columbia. The part of the Report of most general interest is that relating to the tides in the Bay of Fundy. Further observations which have been obtained during the past year confirm the statement previously made by Mr. Dawson that the range of these tides has been greatly exaggerated. The range of spring tides in Noel Bay when they are at a maximum is  $50\frac{1}{2}$  feet and  $43\frac{1}{2}$  feet at neaps; at Horton Bluff, 48 feet and 40 feet; at Cumberland Basin,  $45\frac{1}{2}$  feet and 38 feet. The difference between the level of the highest known tide, the "Saxby tide" of 1869, and the lowest point to which the water has been known to ebb out is 53 feet. The rise of this tide above mean sea-level was  $29^{\circ}24$  feet, and the level of the lowest known low water below mean sea-level was  $23^{\circ}76$  feet. The record tide of 1869 rose from 2 to 3 feet above the banks which protect the enclosed marshes and flooded the country.

IN our issue of February 13 (vol. lxxv. p. 350), two new forms of electric resistance furnace suitable for laboratory work were noticed. The *Zeits. f. Elektrochemie* of April 3 contains details of a research carried out by Herr W. C. Heraeus with a modified form of this furnace relating to the melting point of manganese. The coil of platinum wire was replaced by a strip of very thin foil, wound spirally round the porcelain tube. A temperature of  $1300^{\circ}$  C. could be attained in three minutes with a tube 16 mm. in diameter having a spiral 15 cm. in length wrapped upon it, and by careful attention to the resistance, temperatures could be observed to within  $5^{\circ}$  C. of absolute accuracy. The tube employed in the observation of the melting point of manganese was provided with an alumina boat to carry the small piece of metal used for the determinations—with rubber connections by which hydrogen gas was passed through the tube during the observation—and with a small telescope by means of which the exact moment of melting could be noted. A Chatelier thermo-element was used for recording the temperatures. The mean of six determinations gave  $1245^{\circ}$  C. as the melting point of the metal. Attempts to use nitrogen and carbonic acid gas in place of hydrogen failed, since the former gas yielded a nitride with the manganese and the carbonic acid gas dissociated at  $1000^{\circ}$  C. The reducing action of the hydrogen

gas at the high temperature also caused difficulties with the thermocouple, and many determinations failed owing to the brittleness produced at the point of contact of the two metals.

PROF. H. A. MIERS, who paid a visit in 1901 to the Yukon gold-fields, has published a brief account of his observations, in a letter addressed to the Hon. Clifford Sifton, Minister of the Interior, Ottawa. His principal object was to study the mining methods and the auriferous deposits of the Klondike district. He describes the various methods of thawing the frozen gravel, the latest process being the forcing of water into the ground by means of a pulsometer pump. While admitting the enormous wealth of the district, he points out that it is ceasing to be a poor man's camp, and requires extensive capital and labour for its development. The failures connected with English capital have been disastrous, not necessarily on account of any want of judgment in selecting claims, but mainly because the representatives of English companies "in many cases lacked the judgment and the stability of character which were needed, or had not the interests of their employers sufficiently at heart." At present a comparatively small portion of even the Klondike district has been worked out, while the Yukon territory is auriferous over considerable areas and has been very imperfectly prospected. Moreover, there is nothing to indicate that the gravels and the gold which they contain have been transported any considerable distance, or have been derived from any rocks which differ from those now found in the district. The search for auriferous quartz is therefore hopeful.

THE Summary Report of the Geological Survey of Canada for 1901 (Ottawa, 1902, price 25 cents) extends to 269 pages, being considerably larger than previous reports. This increase has been made by the director, Dr. Robert Bell, in response to the general desire for early information on all points which may be of immediate value to the public. Prominence is therefore given to observations and discoveries which may have an economic bearing. Moreover, the amount of work recorded in this report is believed to have far exceeded that of any previous year. No less than thirty-one parties were engaged in explorations, including those conducted by a number of competent geologists, principally college professors, whose temporary services were secured during the summer season. Dr. Bell contributes an interesting statement on the aims and methods of the work in the field and at headquarters; and the reports of the members of the staff are published under their own names. The Yukon district naturally occupied attention, and mention is made of the occurrence of dendritic gold on a boulder found in one of the creeks, a fact which serves to show that some of the gold has been deposited from solution. Examinations have been made of the Cretaceous coal-fields of Crow's Nest Pass, where there is a vast amount of workable coal of excellent quality; of the oil-fields of Lambton county, Ontario, and of Westmoreland county, New Brunswick; of the natural gas in Essex and Welland counties; and of the Carboniferous Coal-measures of New Brunswick, in which water-worn coal-pebbles have been noticed. In an account of the Cambrian rocks and fossils of Cape Breton, reference is made to the solitary character of the Ostracods, which in other formations occur in profusion. Some remains of *Trionyx* from the Cretaceous rocks of Alberta are described and figured. The glacial origin of cirques or corries and of certain mountain tarns in western Canada is pointed out; and many other topics of general interest are dealt with in the various reports, such as agriculture, including fruit farming, water supply, &c. The occurrence of the mineral faujasite is mentioned as new to Canada.

In the Report of the Selborne Society for 1901-2, the council emphasises the need of new members in order that the work of the association may be carried on with efficiency.

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IN No. 1266 of the *Proceedings* of the U.S. National Museum, Messrs. Jordan and Snyder continue their account of the fishes of Japan, dealing in this instance with the wrasses and their allies. Several new forms are described.

JUDGING by the enlarged size of the April number, the Australian ornithological journal, *The Emu*, appears to be gaining a well-deserved popularity. Among the contents of this issue are a paper on various Tasmanian birds, by Colonel Legge, and a continuation of Mr. D. le Souëff's notes on protective coloration in Australian birds and their nests. Of several excellent illustrations, a group of gannets nesting calls for especial commendation.

A MOST remarkable instance of collateral budding in two annelids belonging to the genus *Trypanosyllis* is described by Dr. H. P. Johnson in the *American Naturalist* for April. Both species are inhabitants of the Pacific coast of America; and the sexual "zooids" they produce by this peculiar mode of budding are very numerous, and, with the parent animal, look like a bunch of fern-leaves. The most remarkable feature about the phenomenon is that the full-grown and detached zooids, although provided with generative organs, entirely lack any functional structures for alimentation. "The zooid is, therefore," as the author remarks, "as incapable of leading a prolonged independent existence as the famed palolo of the South Seas. It is no more than a living engine for the dissemination of the genital products which it carries, and that duty must be accomplished solely by the expenditure of the stored up energy which it had derived from the stock." Other members of the family are known to produce zooids by linear budding; but in this case the zooids are provided with digestive organs. The zooids of *Trypanosyllis* are regarded as an extreme specialisation of those of the linear type. But there is another curious circumstance. In the group producing zooids by linear budding the adult stock is sessile, or nearly so, and the object of having freely moving zooids is therefore apparent. But in *Trypanosyllis* the adult stock is not fixed; and the reason for the development of zooids thus remains to be discovered.

THE Austrian Meteorological Office (Dr. J. M. Pernter, director) has published its *Jahrbuch* for 1900. This valuable series of observations has been issued in practically the same form for thirty-seven years; the present volume contains monthly and yearly results at more than 400 stations, and daily observations at twenty-two stations, including, among a few foreign places, Port-au-Prince (Haiti) and Jerusalem. An interesting feature of this laborious compilation is the reduction and publication of the results obtained from the autographic records of several mountain observatories, including the Sonnblick (3106 metres), Obir (2144 metres) and Berghaus (2044 metres). Dr. M. Margules contributes a detailed discussion of the barometric pressure and wind conditions based on the results of a number of stations in Lower Austria.

DR. P. POLIS, superintendent of the Meteorological Observatory at Aix-la-Chapelle has contributed to the April number of the *Meteorologische Zeitschrift* an interesting paper on the daily period of rainfall. The paper is based chiefly on very careful observations at his own station, and the results have been compared with those obtained at several other European observatories. We can only refer to a few of the conclusions arrived at. He finds that (1) in northern and central Europe the summer and winter seasons have opposite daily periods. In summer the heaviest falls occur in the afternoon, and the lightest near noon and midnight. In winter the maximum occurs from 8h. to 10h. a.m. and from 4h. to 8h. p.m. (2) Maritime climates have a more marked daily period in the winter season, and continental climates in the summer season. (3) At his own



station the maximum amount in spring falls between 6h. and 8h. p.m., while the greatest frequency occurs between 8h. and 10h. a.m.; in summer the maximum amount occurs between 2h. and 8h. p.m., and the greatest frequency between 2h. and 4h. p.m. In winter there are two maxima of quantity, 8h. to 10h. a.m. and 6h. to 8h. p.m., while the time of greatest frequency coincides with first period.

"SOLOID" microscopic stains prepared by Messrs. Burroughs, Wellcome and Co. are aniline and other dyes in a tabloid form easily dissolved in water or alcohol or both, as the case may require, and therefore most useful. They are easily preserved, always ready and portable. The list at present published includes a great variety of the most generally used dyes, as hæmatoxylin, eosin, eosin and methylenblue, fuchsin, gentian violet, thionine blue, &c. While admitting, from direct tests made with some of these soloids, their usefulness, it should not be forgotten that, like other short cuts, also the "Soloid" short cut should only supply a necessity, but should not, and cannot, supplant the recognised laboratory methods. The dye marked "Louis Jenner stain" (eosin and methylenblue) is a good eosin but a bad methylenblue stain, and cannot for a moment compare with Czinzinski's solution (eosin and methylblue.) Pages 3 and 4 of the leaflet issued with the soloids, containing descriptions of methods of staining bacilli and blood, may be safely omitted.

In a series of five papers published during the last few months in the *Journal of Physiology*, Dr. H. M. Vernon has described numerous observations on the zymogens and enzymes of the pancreas. The method used for estimating the tryptic power of extracts depends on the digestion of measured quantities of finely chopped fibrin in small graduated centrifugal tubes. The process is completed in about half an hour, and the average error of experiment is only 5 to 10 per cent. The necessity of adopting a rapid digestion method is shown by the fact, hitherto not adequately recognised, that the tryptic ferment is an extraordinarily unstable body. Thus 70 to 80 per cent. of the ferment in a very active extract may be destroyed in an hour by 4 per cent.  $\text{Na}_2\text{CO}_3$  at  $38^\circ$ . If such extracts be kept for weeks they gradually deteriorate in activity, and the trypsin still remaining undestroyed is found to be a more and more stable body, till finally the last portions of the ferment left may be ten or twenty times more stable than the first. It was accordingly concluded that trypsin is not a single substance, but that there must exist series of tryptins of varying degrees of stability. There are likewise series of rennins, but not of diastases, though it was shown that the diastatic ferments of the pancreas, of saliva and of malt differ from each other considerably in their hydrolysing action on starch. As regards the zymogens, it was found that the rennet ferment has a zymogen very similar to that of the tryptic ferment, whilst the zymogen of the diastatic ferment is an insoluble body. The most energetic agent in the conversion of tryptic zymogen into enzyme was found to be active enzyme itself. Thus if even 1 per cent. of an active extract were added to a solution of zymogen at  $38^\circ$ , it might convert a third of it into enzyme in an hour. Curiously, the rennet ferment was likewise liberated from its zymogen by the tryptic ferment, and not by the rennetic.

MESSRS. BLACKIE AND SON have commenced the issue of a cheap edition of Kerner and Oliver's "Natural History of Plants," which is well known to all students of plant life. The work will be published in sixteen monthly parts at eighteen pence each, and is thus brought within the means of everyone who is interested in the study of botany. Used either as a guide or a reference book, the work is appreciated by all who know it, and it deserves a sphere of influence even greater than that it already possesses.

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WE are glad to learn, from the *Bulletin* of the St. Petersburg Society of Naturalists, that the herbarium of "Flora Rossica," which was begun by the late M. S. I. Korzinsky, member of the St. Petersburg Academy of Sciences, continues to be issued by the Academy under the supervision of M. D. I. Litwinow. Six more fascicules (xiii.-xviii.) appeared lately, together with one fascicule of "Schedæ Herbarium Floræ Rossicæ." We also learn from the same source that M. P. V. Syuzev has undertaken the publication of a "Flora Uralensis exsiccata." This herbarium will comprise chiefly the flora of the province of Perm, but also of Ufa and Orenburg.

A WORK on "The Narym Region," by M. A. Th. Plotnikoff (*Memoirs of the Russian Geographical Society, Statistics*, vol. x. St. Petersburg, 1901), contains a valuable description of a very interesting portion of the province of Tomsk, namely, the portion on the water-divide between the Ob and the Irtysh, as also on the rivers Ket, Parabel and Vas'yugan, which represents mostly an immense marsh—to a great extent a lake during the period of high water in the rivers—and the surface of which is covered with a floating carpet of decayed grass and knolls of ground upon which low bushes of birch will grow. A general description of this wide region (about 100,000 sq. miles) and of its nearly 8000 inhabitants—Russians, Ostyaks and Ostyak-Samoyedes—is given by the author, who has for several years resided at Narym.

ABOUT seventeen years ago, Prof. Salvatore Sardo extracted from the siliquæ of *Bignonia Catalpa* an acid which he called catalpic acid, and to which he assigned the formula  $\text{C}_{14}\text{H}_{14}\text{O}_8$ . A reinvestigation of the products of the *Catalpa* fruit has now been made by Signor A. Piutti and Dr. E. Comanducci, whose results are described in the *Rendiconto* of the Naples Academy, viii. 3. Instead, however, of obtaining an acid with the formula assigned by Sardo, they obtained from the immature pods a substance corresponding to the formula  $\text{C}_7\text{H}_6\text{O}_3$ , which is shown by numerous evidence to be identical with *p*-oxybenzoic acid. In addition they have extracted what appears to be a combination of paroxybenzoic acid and protocatechuic acid, previously obtained in other ways by Hlasiwetz and Barth, having the formula  $\text{C}_7\text{H}_6\text{O}_3$ ,  $\text{C}_7\text{H}_6\text{O}_4 + 2\text{H}_2\text{O}$ , but the attempt to separate the two acids has hitherto ended in negative results, although the other acid appears to have been isolated by Eykman from the fruits of *Illicium religiosum*. Many questions suggest themselves as to the state in which these acids occur in the *Catalpa* fruit, and whether they are free or in combination, and it is proposed to collect a quantity of the fruits for further observation.

THE additions to the Zoological Society's Gardens during the past week include a Lesser White-nosed Monkey (*Cercopithecus petaurista*) from West Africa, presented by Sir William Hoste; a Mozambique Monkey (*Cercopithecus pygerythrus*) from East Africa, presented by Mr. J. Bolt; a Common Viper (*Vipera berus*) European, presented by Mr. C. Spencer Bubb; a Hartbeest (*Bubalis*, sp. inc.) from Angola, purchased; two Japanese Deer (*Cervus sika*) born in the Gardens.

#### OUR ASTRONOMICAL COLUMN.

SATURN VISIBLE THROUGH THE CASSINI DIVISION.—An interesting circular has been issued by Mr. C. T. Whitmell, of Leeds, calling attention to the possibility of this phenomenon being observed. On July 17, 1902, at 13h. G.M.T., Saturn will be in opposition to the sun, and about 7h. G.M.T. on that day the earth and sun will be equally elevated above the ring plane, their Saturnicentric declination being about  $22^\circ 26' 17''$  N. Adopting Prof. Barnard's estimate of 2270 miles for the breadth of the Cassini division, and fifty miles for the thickness of the rings, Mr. Whitmell calculates that the effective opening of the division will be 820 miles, corresponding to  $0''.20$  in angular